THE CLAIMS

What is claimed is:

1. A *SGR* gene encoding a polypeptide comprising amino acid sequence having at least 60% homology with SGR domain I which is conserved amino acid sequence region of 49~207 among amino acid sequence of SEQ ID NO: 30, and inducing leaf yellowing by participating in chlorophyll catabolism during plant senescence.

2. The *SGR* gene according to claim 1, wherein the polypeptide comprises a chloroplast-targeting signal peptide sequence, SGR domain II, and/or SGR domain III which contains 2~6 conserved glutamines (Qs) in C-terminal region.

3. The *SGR* gene according to claim 1, wherein the polypeptide comprises the amino acid sequence selected from the group consisting of SEQ ID NOs: 30 to 50 and 57.

4. The *SGR* gene according to claim 3, wherein the *SGR* gene comprises the DNA sequence selected from the group consisting of SEQ ID NOs: 1 to 21 and 28.

5. A polypeptide encoded by the *SGR* gene of claim 4.

6. A recombinant vector comprising the *SGR* gene of claim 1 or claim 2.

7. A microorganism transformed with the recombinant vector of claim 6.

8. A plant transformed with the *SGR* gene of claim 1 or claim 2.

9. A method for producing a stay-green mutant plant, which comprises mutating *SGR* gene of yellowing plants or fragments thereof.

10. The method according to claim 9, wherein the *SGR* gene encodes the polypeptide comprising amino acid sequence having at least 60% homology with SGR domain I which is conserved amino acid sequence region of 49~207 among amino acid sequence of SEQ ID NO: 30.

11. The method according to claim 10, wherein the polypeptide comprises the chloroplast-targeting signal peptide sequence and SGR domain II, and/or SGR domain III which contains 2~6 conserved glutamines (Qs) in C-terminal region.

12. The method according to claim 10, wherein the *SGR* gene comprises the base sequence selected from the group consisting of SEQ ID NOs: 1 to 21 and 28.

13. The method according to claim 9, wherein the *SGR* gene fragment comprises the DNA sequence selected from the group consisting of SEQ ID NOs: 21 to 29.

14. The method according to claim 9, wherein the mutating of *SGR* gene is carried out by deleting a part of base of said gene, substituting other singular or plural bases for a part of base of said gene, or adding other singular or plural bases to said gene.

15. The method according to claim 12, wherein A substitutes for the 295th base G in the *SGR* gene of SEQ ID NO: 1.

16. A stay-green mutant plant produced by the method of any one claim among claims 9 to 15.

17. A method for producing a stay-green mutant plant, which comprises suppressing the expression of the *SGR* gene in yellowing plant.

18. The method according to claim 17, wherein the *SGR* gene encodes the polypeptide comprising amino acid sequence having at least 60% homology with SGR domain I which is conserved amino acid sequence region of 49~207 among amino acid sequence of SEQ ID NO: 30.

19. The method according to claim 18, wherein the polypeptide comprises the chloroplast-targeting signal peptide sequence and SGR domain II, and/or SGR domain III which contains 2~6 conserved glutamines (Qs) in C-terminal region.

20. The method according to claim 18, wherein the *SGR* gene comprises the base sequence selected from the group consisting of SEQ ID NOs: 1 to 21 and 28.

21. The method according to claim 17, wherein suppressing the expression of the *SGR* gene is performed by gene silencing technique.

22. A stay-green mutant plant produced by the method of any one claim among claims 17 to 21.

23. A method for producing a stay-green mutant plant, which comprising the steps of:

(a) obtaining a recombinant vector by introducing a *SGR* gene or a fragment thereof originated from target plant to be mutated, to T-DNA vector; and

(b) transforming a wild type plant with the recombinant vector.

24. The method according to claim 23, wherein the *SGR* gene encodes the polypeptide comprising amino acid sequence having at least 60% homology with SGR domain I which is conserved amino acid sequence region of 49~207 among amino acid sequence of SEQ ID NO: 30.

25. The method according to claim 24, wherein the polypeptide comprises the chloroplast-targeting signal peptide sequence and SGR domain II, and/or SGR domain III which contains 2~6 conserved glutamines (Qs) in C-terminal region.

26. The method according to claim 24, wherein the *SGR* gene comprises the base sequence selected from the group consisting of SEQ ID NOs: 1 to 21 and 28.

27. The method according to claim 23, wherein the *SGR* gene fragment comprises the DNA sequence selected from the group consisting of SEQ ID NOs: 21 to 29.

28. The method according to claim 23, wherein the T-DNA vector is a vector for RNAi which induces gene silencing by making the double-stranded RNA (dsRNA) in a transgenic plant.

29. The method according to claim 23, wherein the recombinant vector comprises CaMV35s promoter or senescence-enhanced promoter.

30. A stay-green mutant plant produced by the method of any one claim among claims 23 to 29.

31. A method for producing a stay-green mutant plant, which comprises inactivating the protein encoded by the *SGR* gene in yellowing plant.

32. The method according to claim 31, wherein the *SGR* gene encodes the polypeptide comprising amino acid sequence having at least 60% homology with SGR domain I which is conserved amino acid sequence region of 49~207 among amino acid sequence of SEQ ID NO: 30.

33. The method according to claim 32, wherein the polypeptide comprises the chloroplast-targeting signal peptide sequence and SGR domain II, and/or SGR

domain III which contains 2~6 conserved glutamines (Qs) in C-terminal region.

34. The method according to claim 32, wherein the *SGR* gene comprises the base sequence selected from the group consisting of SEQ ID NOs: 1 to 21 and 28.

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35. A stay-green mutant plant produced by the method of any one claim among claims 31 to 34.